STANDARDS

The Foundation for Interoperability

PROGRAM MANAGEMENT OVERVIEW FOR THE NCGIS

July 2004

NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

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1. INTRODUCTION

The National Center for Geospatial Intelligence Standards (NCGIS) is charged with developing, implementing, and sustaining a comprehensive, enterprise-wide Geospatial Intelligence Standards Program for the National System for Geospatial-Intelligence (NSG) community, i.e., the Department of Defense (DoD) and the Intelligence Community (IC), including, where appropriate, the National Geospatial-Intelligence Agency's (NGA) civil and coalition partners. By following a corporate strategy, or Standards Roadmap, the NCGIS will address standards issues relevant to evolving information technologies, data and system architectures, and software tools to ensure interoperability and collaborative business practices. In supporting the Director of NGA's responsibilities as Functional Manager of geospatial intelligence standards activities, the NCGIS will work in a collaborative environment, being an advocate for and representing the needs of NGA and the NSG community in appropriate government and non-government standards forums.

The NCGIS will ensure a coordinated standards-based approach to achieving geospatial intelligence information interoperability within the context of transformational activities taking place within NGA and the NSG. The NCGIS is charged with managing geospatial intelligence standards that provide the NSG Community with the ability to:

a. Share whatever information or intelligence is needed across the defense, intelligence, and homeland security communities,
b. Eliminate proprietary, costly, and fragile "stovepipe" interfaces and components from the NSG,
c. Quickly and effectively respond to the needs of the warfighter in all modes of operation, including Military-Operations-Other-Than-War,
d. Sustain efficient and assured intelligence operations, even during periods of changes in mission and technologies,
e. Maximize use of tested standards-based commercial off-the-shelf (SCOTS) components, and
f. Efficiently meet system requirements and reduce risks associated with acquisitions.

The NCGIS will develop a detailed budget from its funding allocation with the objective of maximizing its impact. It will choose its initiatives carefully to maximize the benefits it brings to NGA and the NSG community and conduct activities that have a clear justification and positive economic return. The NCGIS will effectively support the development of NSG components with well-known interfaces, moving the NSG toward a fully componentized system where each interface is standards-based and available in the competition of the commercial marketplace. The NCGIS will also apply resources and invest in initiatives that address the most important standards problems and provide the highest rate of return. The NCGIS will leverage its NSG partnerships and the work of other consensus-based standards organizations.

2. PURPOSE AND SCOPE OF MANAGEMENT OVERVIEW

This NCGIS Program Management Overview provides an overview of the management operations of the NCGIS and Geospatial Intelligence Standards Program. It sets forth the:

a. **Authority** for NCGIS leadership and direction,
b. **Scope** of the NCGIS and the Geospatial Intelligence Standards Program
c. **Roles and responsibilities** of NGA and the NCGIS,
d. **Organization and management structures** of the NCGIS and the Geospatial Intelligence Standards Program,
e. **Key relationships external to NGA**,
f. **Key relationships within NGA**,
g. **Key program processes** necessary for the NCGIS to meet its objectives and implement its plans, and
h. **Specific activities** that will be conducted to build the Geospatial Intelligence Standards Program Infrastructure.

The processes, key relationships, and specific activities outlined here are necessary to carry out the goals and objectives of the Geospatial Intelligence Standards Program. They provide the supporting infrastructure within which the NCGIS program of work will be carried out.

This overview was heavily influenced by the finding of the 2003 Standards Tiger Team. The Geospatial Intelligence Standards Program management structures and processes were modeled after the National Security Agency/Central Security Services (NSA/CSS) Enterprise Standards Program (NESP) [1].

3. AUTHORITY

Authority to act as the Functional Manager for Geospatial Intelligence, including standards, is given to the Director of NGA [formerly NIMA] in *DoD Directive 5105.60 National Imagery and Mapping Agency (NIMA)* [2], October 11, 1996. Additionally, this directive establishes NGA within the DoD, consistent with the authorities and duties of the Secretary of Defense and the Director of Central Intelligence (DCI) under Title 10 and 50 United States Code and Executive Order 12333, "United States Intelligence Activities," December 4, 1981. This directive applies to "the Office of the Secretary of Defense, the Military Departments, the Chairman of the Joint Chiefs of Staff, the Combatant Commands, the Office of the Inspector General of the DoD, the Defense agencies, and the DoD Field Activities…and other Federal Departments and Agencies on matters related to the statutory NIMA mission." It further assigns the Director of NGA the responsibility to advise "the Secretary and Deputy of Defense, the ASD (C3I), the Chairman of the Joint Chiefs of Staff, the Combatant Commanders, and, for national intelligence purposes, the DCI and other Federal Government officials, on imagery, imagery intelligence, and geospatial information; and supports the imagery, imagery intelligence, and geospatial requirements of the Departments and Agencies of the Federal Government, to the extent provided by law." Section 6.11 specifically assigns the Director of NGA the responsibility to prescribe and mandate standards for imagery, imagery intelligence, and geospatial information for all DoD Components and non-DoD elements of the Intelligence Community. In section 6.21, the Director of NGA is also given the responsibility to "Represent the Department of Defense in national and international geospatial information standardization activities."

DoD Instruction 4120.24 "Defense Standardization Program (DSP)" [3] directs DoD components (including Defense Agencies such as NGA) to implement the policies and procedures of the DSP, as defined in DoD 4120.24-M [4], "Defense Standardization Program

(DSP) Policies and Procedures," March 2000. Heads of DoD components (including the Director of NGA) are responsible for ensuring compliance with DSP policies and procedures. In the Department of Defense Standardization Directory, "FSC Class and Area Assignments (SD-1) [5], issued by the Defense Standardization Program Office (DSPO), NGA is designated as the Lead Standardization Activity (LSA) for the Geospatial Intelligence Technology standardization area. NGA will fulfill these designated responsibilities in accordance with DSP policies and procedures.

On September 18, 2002, the Director of NGA authorized the establishment of the NCGIS, to become operational on October 1, 2003, and charged it with developing a comprehensive coordinated Geospatial Intelligence Standards Program to carry out the Director's responsibilities as Functional Manager for geospatial intelligence standards. **Figure 1** depicts the authorities that direct the Director of NGA and the NCGIS to oversee geospatial intelligence standards activities.

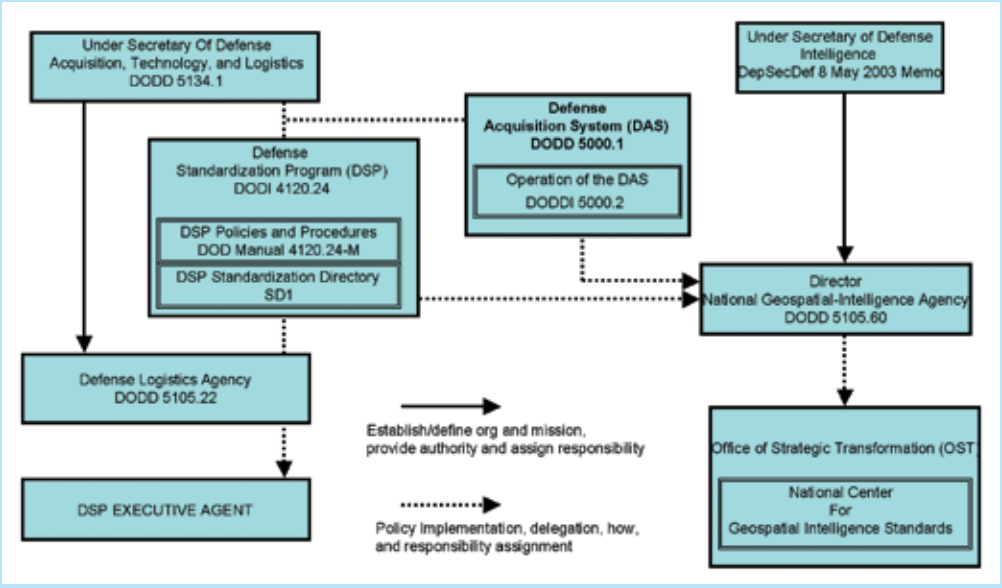

Figure 1: Director/NGA and NCGIS Mission Authorities

In addition to carrying out the responsibilities as assigned through the above authorities, the NCGIS and the Geospatial Intelligence Standards Program will align standards, activities, and initiatives with other government mandates, policies, and directives related to standards development and implementation. Specifically, the NCGIS will meet the goals and objectives of the *National System for Geospatial-Intelligence (NSG) Strategic Intent, January 2004* [6] and will follow DoD guidance, policies and directives, such as DoD Directive 5000.1 [7], DoD Instruction 5000.2 [8], and the *DoD Net-Centric Data Management Strategy* [9], March 28, 2003. The NCGIS will also follow Federal guidance and mandates for standards activities such as OMB Circular A-119, *Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities* [10].

See Appendix B: DoD and NGA Standardization Authorities for further descriptions of authorities for NGA leadership in geospatial intelligence standards.

4. SCOPE OF NCGIS ACTIVITIES

The scope of the NCGIS standards activities extends to those standards issues that affect geospatial intelligence and their enabling technologies. The role of the NCGIS is limited to the technologies, and their associated procedures, by which NGA and the NSG community encode, represent, store, discover, and distribute geospatial intelligence data and information that is shared within an interoperable environment with other NSG components. Examples of geospatial intelligence standards addressed by the NCGIS include geospatial intelligence metadata, imagery content and format, geographic feature encoding and portrayal, geospatial intelligence reporting, and information transfer.

5. DIRECTOR OF NGA AND NCGIS ROLES AND RESPONSIBILITIES

As the Functional Manager for geospatial intelligence standards, under authority designated by DoD Directive 5105.60, the Director of NGA shall:

a. Have authority over all standardization activities and functions related to imagery, imagery intelligence, and geospatial information,
b. Ensure a viable domain-based, geospatial intelligence standardization program and management structure,
c. Prescribe and mandate standards as appropriate, and
d. Represent the DoD on appropriate DoD, Federal, national, international, and industry standards development and coordination forums.

The NCGIS will carry out the Director of NGA's responsibilities as Functional Manager for geospatial intelligence standards and, as the designated lead standardization activity for geospatial intelligence under the DSP, create and maintain a Geospatial Intelligence Standards Program that will:

a. Actively coordinate and lead the DoD, IC, and civil communities on all matters relating to geospatial intelligence standards,
b. Represent and advocate for NGA and the NSG community on standards development and implementation organizations,
c. Pursue standards that enhance the ability to manage and preserve the integrity of geospatial intelligence data and information, including development of standards profiles,
d. Be the central prescribing and mandating authority for geospatial intelligence standards,
e. Develop and implement corporate strategies necessary to meet NCGIS goals and objectives,
f. Prioritize and oversee all NGA/NSG geospatial intelligence standards activities falling within the scope of the NCGIS,
g. Develop and enforce standards policy and provide appropriate standards guidance and direction,
h. Ensure implementation of GEOINT standards in the NSG enterprise architecture,
i. Promote and speed the development of best practices in standards management,
j. Address standards issues and their impacts on geospatial intelligence,

k. Monitor and exploit commercial standards, including the return on investment in standards, measured at the enterprise level (vice the individual program level),
l. Sponsor consortia test-beds and standards development activities, and
m. Establish outreach mechanisms to communicate and promote NCGIS goals, standards, and activities.

6. ORGANIZATION AND MANAGEMENT STRUCTURES

NCGIS Organizational Structure

The NCGIS resides in the NGA Office of Strategic Transformation (OST), Geospatial Intelligence Standards Division (OST GIS), led by the Director, OST GIS (D/OST GIS). The NCGIS will implement the Geospatial Intelligence Standards Program and will recommend standards management policy to D/OST GIS. The NCGIS brings together within its organization many of the geospatial intelligence standards activities taking place across NGA and will work closely with other standards activities that remain in other NGA organizational units. This more centralized approach to standards management allows NGA to more efficiently and effectively develop coherent standards strategies, set and enforce standardization policy and priorities within NGA, coordinate standardization policy with NSG stakeholders, and act as an advocate for NSG requirements in commercial standards forums and consortia. The NCGIS, thus, provides a coordinated perspective on standards to represent the authoritative Director, NGA and NCGIS position. Through funding and resources, the NCGIS can exercise its authority and influence to the benefit of all of NGA and the NSG community.

Figure 2 depicts the current NCGIS organizational structure.

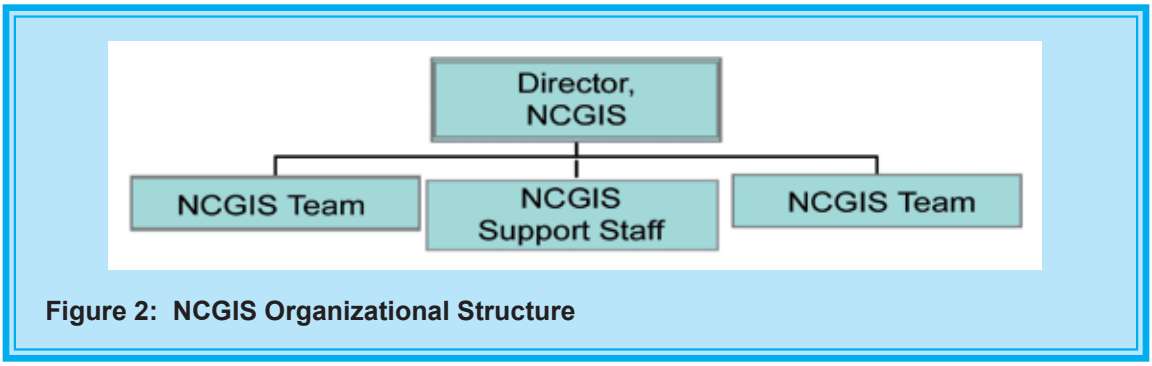

Figure 2: NCGIS Organizational Structure

Director, NCGIS

The D/NCGIS serves as the principal advocate for geospatial intelligence standardization activities on behalf of the NSG community and serves as the single high-level point of contact for all geospatial intelligence standards activities within NGA, the DoD and the IC. The D/NCGIS chairs the Geospatial Intelligence Standards Working Group (GWG) under the Defense Information System Agency (DISA) sponsored Information Technology Standards Committee (ITSC). The D/NCGIS also provides direct leadership to the NCGIS support staff and supporting standards teams. The Director, NCGIS is responsible for managing all NCGIS standards activities, including yearly budget and implementation plans.

Geospatial Intelligence Standards Program Components

Figure 3 depicts the key entities within the standards management structure of the Geospatial Intelligence Standards Program. The NCGIS will participate in key NGA internal governance forums and provide the management oversight, direction, and support for a community-based forum, represented by the GWG.

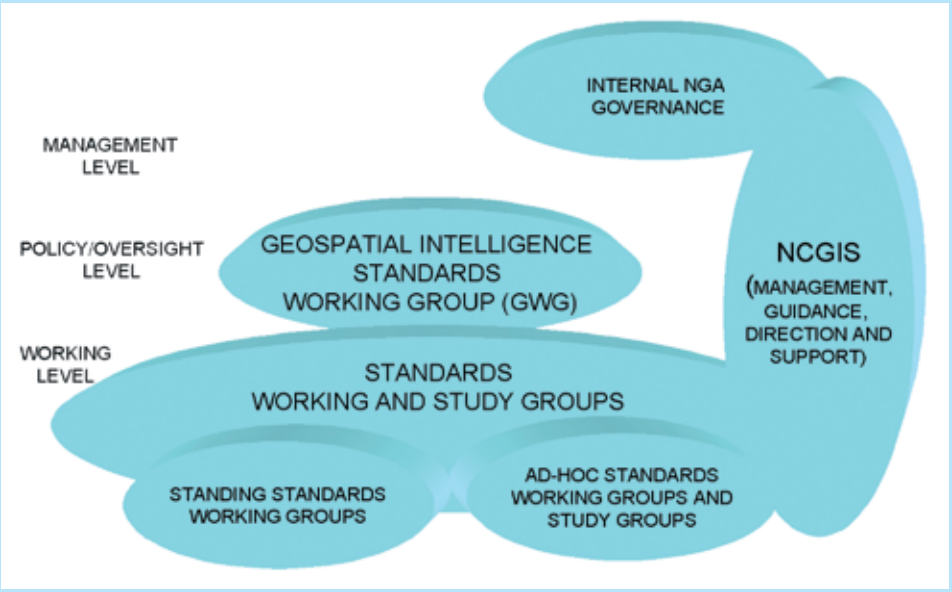

Figure 3: Geospatial Intelligence Standards Program Components

Internal NGA Governance

Existing NGA external and internal governance structures will be used to advance and implement community-based decisions relating to GEOINT standards. The NCGIS will work within current requirements, acquisition, and other NGA established mechanisms, using the community-based forum to recommend, review, and vet necessary GEOINT standards.

Geospatial Intelligence Standards Working Group (GWG)

The GWG is a consensus forum that operates under the DISA sponsored ITSC. It is chaired by the D/NCGIS and composed of representatives from key DoD, IC, and Civil Federal Agencies, as defined in its charter. The GWG will act as the NSG community forum for the exchange of information on geospatial intelligence standards and related standards activities. The GWG will also make recommendations on the adoption of GEOINT standards into the DoD IT Standards Registry (DISR).

Standards Working and Study Groups

The Standards Working and Study Groups represent specific standardization areas designated by the GWG and are composed of Subject Matter Experts (SMEs) from organizations within the NSG community. They are charged with staying abreast of standards issues and opportunities within their agencies and within external standards organizations and with

making informed recommendations to the GWG on all standards related issues within their subject areas.

The NCGIS will coordinate with internal NGA organizations and other participating agencies to identify the appropriate SMEs for GWG working group participation.

Ad Hoc Standards Working and Study Groups

Ad hoc working groups will be established by the GWG when needed to resolve issues related to short-term activities to support the Geospatial Intelligence Standards Program. For example, ad hoc committees may be formed to write policy documents, procedural guidelines, or educational materials.

7. KEY RELATIONSHIPS

The Geospatial Intelligence Standards Program as implemented by the NCGIS is committed to fostering a standardization environment of collaboration through the development of key organizational relationships. **Figure 4** identifies the key internal NGA and external organizations that the NCGIS will develop relationships with in order to meet its goals and objectives.

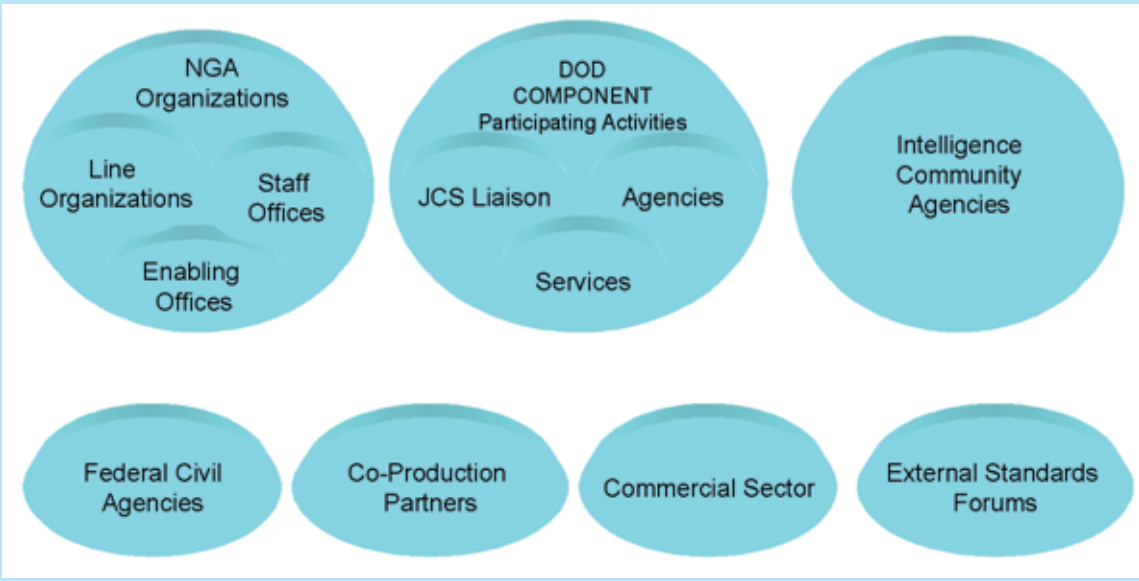

Figure 4: Key Organizations

Key External Organizations

Intelligence Community – The IC consists of federal branch agencies and organizations that work separately and together to conduct intelligence activities necessary for the conduct of foreign relations and the protection of the national security of the United States, including the intelligence components of the DoD. Examples of the key organizations whose active participation in the Geospatial Intelligence Standards Program is required are the National Security Agency (NSA), National Reconnaissance Office (NRO), and Central Intelligence Agency (CIA).

DoD Components - The DoD Components include the Military Departments (e.g., Army, Navy, and Air Force), Unified Combatant Commands, Defense Agencies (e.g., Defense Intelligence Agency (DIA) and DISA), and Joint Chiefs of Staff (J2, J6 and J8). Participation in the Geospatial Intelligence Standards Program may also include the DoD Field Activities and Inspector General as appropriate. The NCGIS will continue to maintain liaison, coordination, and participation, as appropriate, with the DISA and its Joint Interoperability Test and Evaluation Command (JITC) for the exchange of information on standardization programs and activities in the field of assigned responsibility. Through the GWG, the NCGIS will also coordinate population of the DoD Information Technology Standards Registry (DISR) with geospatial intelligence standards.

Federal Civil Agencies - The NCGIS will work with Federal civil agencies primarily through civil standardization organizations, such as the Federal Geographic Data Committee (FGDC), to ensure that the IC and DoD standardization goals, objectives and attendant strategies are coordinated and de-conflicted wherever possible to ensure a logical and technically sound implementation.

Production Partners - Production partners of NGA are those agencies or countries that enter into agreements with NGA to cooperatively produce geospatial intelligence. The NCGIS will work with these national and international organizations on relevant geospatial intelligence standards issues.

External Standards Forums – External standards forums include government and non-government as well as domestic and international forums and consortia. Their missions and activities range from specifying standards requirements to developing, adopting, compliance testing, mandating or advocating for standards. The NCGIS will participate in those forums that advance the overall goals and objectives of the Geospatial Intelligence Standards Program, in particular the achievement of open consensus-based standards architecture. Examples of standards forums include the American National Standards Institute (ANSI), Open GIS Consortium (OGC), and International Organization for Standardization (ISO).

Commercial Sector - The commercial sector consists of those companies and vendors that develop and sell new hardware and software technologies and products to the government or market commodity data to the public that might also have value to the government. The NCGIS will establish relationships, where appropriate, with commercial vendors and consortia in order to communicate NSG requirements and influence those communities to meet those requirements through SCOTS solutions.

Key NGA Organizations

The NCGIS will work with all appropriate NGA organizations in the development and implementation of geospatial intelligence standards. Each NGA line organization, specifically, the Acquisitions Directorate (A), InnoVision Directorate (I), Analysis and Production Directorate (P), and Source Operations and Management Directorate (S) and with appropriate offices, such as the Office of International and Policy (OIP) and Office of Geospatial Intelligence Management (OGM). The NCGIS will coordinate with outreach organizations such as the NGA Office of Corporate Relations to ensure that a consistent message on geospatial intelligence interoperability and related standards reaches NGA and NSG communities. The NCGIS will also work with NGA's National Geospatial Intelligence College in developing courses to educate the NSG community on relevant NCGIS and geospatial intelligence standards topics.

8. GEOINT STANDARDS PROGRAM PROCESSES

The NCGIS will establish the processes necessary to meet the goals and objectives of the Geospatial Intelligence Standards Program. The following is a list of program processes with a brief description of the activities they entail and what they will accomplish. Detailed process plans will be documented that define each of the steps and the specific organizational relationships for each process.

- Standards Life-Cycle Management Planning Process
  The Standards Life-Cycle Management Planning Process encompasses the activities that identify and evaluate standards requirements and plan the subsequent fiscal year business plan of the NCGIS. Community needs, architecture dependencies, resource requirements, standards forum participation, key relationships, and the need for standards development and/or profile extensions are taken into consideration. This process works within the NCGIS conceptual framework for decision-making shown in **Figure 5**.

- Standards Selection and Adoption Process
  The Standards Adoption Process encompasses activities to formally select and approve NSG relevant GEOINT standards, including specific commercial standards. It includes using established certification criteria, such as meeting NSG requirements and NCGIS goals, use of SCOTS solutions, technical merits, and economic/financial/marketplace benefits, to evaluate recommended standards and a decision-making mechanism to formally adopt them. This process will align with the adoption process defined by the DSP and will work within the NCGIS conceptual framework for decision-making shown in **Figure 5**. It will result in a set of adopted standards mandated for future acquisitions.

- Standards Implementation Process
  The Standards Implementation Process encompasses activities associated with incorporation and verification of prescribed GEOINT standards in the NSG enterprise architecture, including the development of standards profiles early in the project life cycle and refinement of them as the project progresses.

- Conformance Assessment Process
  The Conformance Assessment Process includes activities related to evaluating and enforcing standards compliance across the enterprise and determining impacts of compliance and non-compliance on NGA and the NSG. It also includes developing mitigating strategies.

- Communication and Outreach Process
  The Communication and Outreach Process includes the activities that communicate NCGIS goals, mission, and strategic intent, promote and increase awareness of standards and their importance to system and data interoperability, provide relevant standards information, including policies and guidance, and conduct activities related to training and education.

- Commercialization Process
  The Commercialization of Standards Process includes those activities conducted for the purpose of identifying standardization requirements of the NSG and influencing the migration of SCOTS to meet those requirements.

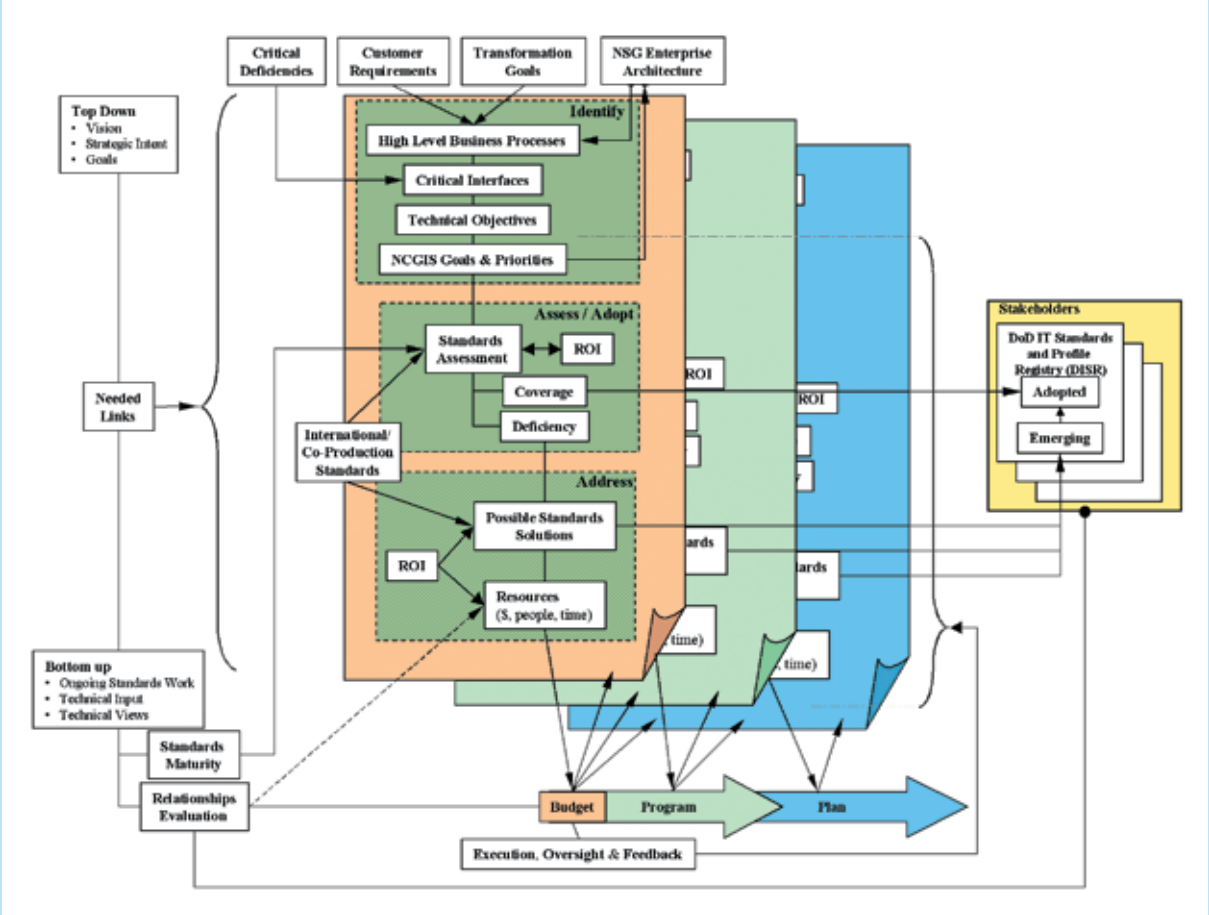

Figure 5: Conceptual Framework for Standards Decision Making Process

Prior to the stand up of the NCGIS, many strategic documents and thrusts have been articulated that project a vision of the NSG, its strategic intent and the goals of the enterprise – so called 'top-down' direction. Meanwhile, much "bottom-up" effort has been dedicated to furthering core standards that underpin NGA's current geospatial framework. The Standards Tiger Team identified the need to connect these "top-down" and "bottom-up" approaches and to provide a documented and repeatable business process.

The conceptual framework provides the critical link between these differing levels of activity and direction and provides a business model for coordinated decision-making. This conceptual framework allows the NCGIS to **identify** & track the progress of standards efforts in relation to key interoperability issues; **assess** the fulfillment of these issues by considering them against the range of extant standards and standards activities; and **address** those deficiencies by looking at a range of developmental alternatives balanced through an assessment of the return on investment of the effort.

This identify / assess / address process is aligned with the underlying NGA organizational structure of Now, Next and After-Next and, for programmatic purposes, to the budget, POM and beyond-POM time-periods. Working within this framework, the NCGIS will follow a repeatable business process that maintains a corporate focus on its efforts.

9. BUILDING A GEOSPATIAL INTELLIGENCE STANDARDS KNOWLEDGE BASE

The concept of a Standards Knowledge Base (SKB) will drive many of the activities of the NCGIS. The SKB encompasses the totality of geospatial intelligence standards information made readily available for use in decision-making and in support of the management and operations of the NCGIS and the Geospatial Intelligence Standards Program. The SKB represents the community-accessible repository of documents, activities, plans, and accomplishments of the NCGIS. The SKB includes a registry of adopted standards and interface specifications, operating procedures, best practices, test suites, test results, and other information useful to the NSG community. It also encompasses candidate standards, plans for advancing candidates to "adopted" status, test plans, interoperability initiatives, etc. The web-accessible technology upon which the SKB is built will enable the search and discovery of an array of geospatial intelligence standards information, including the optimum standards-compliant solutions to meet the needs of system architects. The NCGIS will act as the primary authority for inclusion of information in the SKB. The primary goal of the SKB is to support the ever-increasing information interoperability across the NSG Community.

10. BUILDING THE GEOSPATIAL INTELLIGENCE STANDARDS PROGRAM

The following are specific activities and actions the NCGIS will conduct to build and manage the Geospatial Intelligence Standards Program. Activities with the notation (SKB) are supported by the standards knowledge base.

1. Maintain an awareness of and participation in relevant standards activities and the standards bodies that support them. NGA must identify and prioritize these activities to determine the greatest return on investment from an enterprise perspective. The NCGIS will invest in only those standards activities that are critically important to meeting its goals and objectives and which are cost-beneficial to the NSG community. In order to accomplish this, the NCGIS will:

a. Define and document a repeatable, comprehensive review process to identify and assess NCGIS participation and support to standards organizations and other standards activities. (SKB)
b. Establish and maintain a database to track all relevant standards activities and projects. (SKB)

2. Adopt and endorse the use of appropriate robust standards that meet NGA requirements and those of the NSG community. The NCGIS will perform independent assessments in coordination with the appropriate validation and certification activities in place throughout the NSG community to determine a set of common geospatial intelligence standards. In order to accomplish this, the NCGIS will:

a. Define and document a process to identify, assess, and formally approve geospatial intelligence standards and critical standards profiles for use in the NSG enterprise architecture. (SKB)

b. Develop and maintain an organized and web-accessible standards database of officially endorsed NCGIS standards, including a metadata repository. (SKB)
c. Identify and maintain the connectivity of standards to relevant architecture pieces through NGA's management tools for systems requirements, architecture, and data engineering. (SKB)
d. Review selected SCOTS software for their compliance with NCGIS-endorsed standards. (SKB)
e. Review existing standards policy and revise or create new policy where appropriate for the use of geospatial intelligence standards within NGA. (SKB)
f. Coordinate with appropriate organizations to identify and evaluate legacy specifications that may need to be replaced or updated. (SKB)
g. Develop and maintain a comprehensive collection of standards-related risks, their criticality, and their work-off plans. (SKB)

3. Mandate and implement standards within the NSG enterprise architecture. The NCGIS will maintain an active role in the requirements and acquisition processes within NGA, and in coordination with the rest of the NSG community, in order to advocate, monitor, and enforce the use of NCGIS-endorsed standards through these processes. This requires influencing the transition of NGA systems to use these standards and their associated technologies. In order to accomplish this, the NCGIS will:

a. Define and document a process to implement adopted standards and standards profiles in the enterprise architecture. (SKB)
b. Assess emerging and evolving requirements and acquisition processes used within NGA to determine the impact on NCGIS standards adoption and implementation processes, and propose requirements process and policy changes that build key interfaces with the NCGIS and facilitate the adoption of NCGIS-endorsed standards.
c. Work with program/project personnel to facilitate development of program/project standards profiles early in the project life cycle and refinement of them as the project progresses.
d. Establish liaison and relationship with NGA's enterprise system developers and enterprise engineering teams, articulating requirements to support GEOINT standards. (SKB)
e. Coordinate with NGA internal organizations and actively participate/lead in activities of NGA's transformation to ensure NCGIS endorsed standards are implemented.

4. Coordinate geospatial intelligence standards activities within NGA and within the NSG community. The NCGIS is responsible for fostering collaboration within the broad spectrum of stakeholders in the NSG community in order to meet their standardization and informational needs. The NCGIS will exchange information and make decisions in coordination with community members on existing or evolving standards and standards activities that may impact users of geospatial intelligence standards. In order to accomplish this, the NCGIS will:

a. Create a NSG community standards forum (i.e., the GWG), including specialized working groups, to address geospatial intelligence standards issues.
b. Utilize the GWG and appropriate internal NGA governance bodies to address

GEOINT standards issues relevant to NGA transformation activities and efforts.

c. Identify and establish points of contact with key NGA and NSG community organizations, including outreach and customer support offices and key standards related committees and boards. (SKB)
d. Identify and maintain a list of SMEs and key organizational POCs. (SKB)
e. Develop mechanisms for obtaining and, if necessary, funding SME resources.
f. Revise NGA's Functional Manager's Guidance for standards on an annual basis. (SKB)
g. Maintain updated language in the DoD Standardization Directory (SD-1) of the Defense Standardization Program (DSP) to properly reflect NGA responsibilities. (SKB)

5. Communicate NCGIS information and standards activities and provide educational and training opportunities. The NCGIS must actively identify and engage in outreach activities that promote understanding of, and involvement in, standards and help establish and strengthen mutually beneficial internal and external relationships. Sharing information and fostering communication and education on standards, through a planned and coordinated approach, is of key importance to meeting the mission and goals of the Geospatial Intelligence Standards Program. In order to accomplish this, the NCGIS will:

a. Develop and document a process to determine communication, education, and training requirements and mechanisms for satisfying them. (SKB)
b. Build communication mechanisms, such as a web site, reflector lists, e-mail, and common directories using File Transfer Protocol. (SKB)
c. Create NCGIS visual identity, fact sheet, and brochure. (SKB)
d. Create presentation materials on NCGIS and standards. (SKB)
e. Identify, plan, and conduct customer site visits.
f. Identify and develop needed geospatial intelligence standards guidelines and directives. (SKB)
g. Establish liaison with NGA's National Support Teams and Outreach Offices within NGA and external organizations.
h. Identify conferences/exhibits/workshops for NCGIS participation or sponsorship.
i. Develop presentation and exhibition materials to use in conferences, workshops, and symposiums.
j. Identify training and educational requirements and mechanisms for fulfilling them, such as NGA's National Geospatial Intelligence College.
k. Develop a leadership engagement plan that identifies key NGA and NSG community leaders and target audiences and the information to be communicated.
l. Develop a plan to communicate NCGIS standards plans and activities to key internal NGA organizations and personnel.
m. Develop a customer engagement plan to communicate information and involve customers.

6. Develop standards enforcement mechanisms, support standards conformance testing, and evaluate enterprise compliance. In order for standards to be usable and effective, they must first work within and then be consistently applied across the enterprise architecture. The NCGIS must ensure that a standard works before it is endorsed and must evaluate its effectiveness. In order to accomplish this, the NCGIS will:

a. Develop and document processes that support testing of emerging geospatial intelligence standards, evaluation of system compliance with these standards across the enterprise, and determination of impacts of compliance or non-compliance on NGA and the NSG, including development of enforcement mechanisms. (SKB)
b. Coordinate standards testing and conformance evaluations with existing assessment mechanisms, such as the JITC and NGA's Geospatial Intelligence Advancement Testbed (GIAT), NGA Pre-Production Environment (NPE), and NGA's Integrated Testing Facility (ITF).

7. Maintain an awareness of the pace and direction of technology evolution and standards development activities. The inevitable evolution of technology and the ongoing changes in requirements for standardization create a dynamic standards environment. It is imperative, in this dynamic environment, to be prepared for continuous additions, replacements, and revisions to standards that will impact the NSG enterprise architecture. The NCGIS must keep fully informed of these future developments. In order to accomplish this, the NCGIS will:

a. Identify and gain consensus on future standards to adopt as replacements for DoD standards and specifications. (SKB)
b. Evolve the NCGIS standards management policy based on new trends in technology. (SKB)

8. Communicate geospatial intelligence needs to industry vendors and influence the development and evolution of commercial standards and products. To meet Federal and DoD mandates, the NSG must move towards the use of SCOTS solutions and influence the commercial vendor community to migrate their products to meet NSG requirements. The NCGIS is committed to supporting this transition. In order to accomplish this, the NCGIS will:

a. Define and document a process to identify requirements of the NGA and NSG community that can be met through commercial standardization. (SKB)
b. Influence the commercial vendor community to revise existing standards, or insert Government-defined standards requirements into new technologies for commercialization to meet those requirements in areas where commercial technology is immature or non-existent. (SKB)

9. Document case studies of specific standards activities. Understanding the success and failure of related standards activities across the government and private sector will help the NCGIS make informed decisions. In order to accomplish this, the NCGIS will:

a. Identify and document relevant industry and government case studies and appropriate lessons learned. (SKB)
b. Create a library to contain case studies and lessons learned and make it available to enterprise architects, systems planners, engineers, and integrators within NGA, and to their counterparts in other agencies across the NSG community. (SKB)

10. Conduct budgetary activities and program assessments. The NCGIS must have an operational strategy and demonstrate a business case to sustain a viable Geospatial Intelligence Standards Program. In order to accomplish this, the NCGIS will:

a. Develop and implement a funding and staffing strategy, justifying all projects receiving financial or staff support using metrics and assessments of return on investment.
b. Develop and implement a cost/benefits analysis strategy using metrics to assess program and project accomplishments and determine return on investment (ROI).
c. Conduct yearly assessment and update of a NCGIS business plan. (SKB)

11. APPENDICES

Appendix A: References

1. National Security Agency/Central Security Services (NSA/CSS) Standards Program Overview, December 2001.

2. DoD Directive 5105.60, National Imagery and Mapping Agency (NIMA).

3. DoD Instruction 4120.24, Defense Standardization Program (DSP), 18 June 1998.

4. DoD 4120.24-M, *Defense Standardization Program (DSP) Policies and Procedures*, March 2000.

5. Department of Defense Standardization Directory, *FSC Class and Area Assignments* (SD-1), May 1, 2003.

6. National System for Geospatial-Intelligence (NSG) Strategic Intent, January 2004.

7. DoD Directive 5000.1, *The Defense Acquisition System*, May 12, 2003.

8. DoD Instruction 5000.2, *Operation of the Defense Acquisition System*, May 12, 2003.

9. DoD Net-Centric Data Management Strategy, March 28, 2003.

10. OMB Circular A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities.

Appendix B: DoD and Director, NGA Standardization Authorities

The following DoD directives and instructions trace the authorities and requirements for DoD standardization activities and programs and NGA's leadership for geospatial intelligence standards activities.

Joint Vision 2020

Standardization in support of the Warfighter: Standardization is at the heart of Joint Vision 2020, which is the guiding template for future direction in warfare in the DoD. The following are key Joint Vision 2020 doctrines that require standardization to be successful:

a. Interoperability with multinational partners and among the Military Departments requires standardization of physical, electronic, and functional interfaces and performance requirements.

b. Information superiority demands standardized data and equipment interfaces and performance requirements to permit information to be shared among systems and personnel.

c. Rapid new technology insertion requires standard interfaces and performance requirements. Since the DoD must retain existing systems for decades beyond their planned life, affordable technology refreshments will depend in part on our ability to define standard solutions across systems based on performance and interface requirements.

The Defense Standardization Program

Standardization across all DoD components is realized under the Defense Standardization Program (DSP). Standardization is seen as an enabling strategy, by which the goals of Joint Vision 2020 can be achieved, to provide the war fighter with equipment that is interoperable, reliable, and technologically superior.

DoD Instruction 4120.24: This instruction implements the DSP as required by Title 10 United States Code, which requires the Secretary of Defense to maintain a unified defense standardization program. It designates the Director, Defense Logistics Agency (DLA) as the DoD Executive for the DSP and assigns responsibilities and prescribes procedures for DoD standardization activities. The Instruction, which applies to all the DoD Components, states, "It is DoD policy to promote standardization of material, facilities, and engineering practices to improve military operational readiness, reduce total ownership costs, and reduce acquisition cycle time. There shall be a single, integrated DSP and …specifications, standards, and related documents." The Instruction further directs the Director, DLA to appoint the DoD Standardization Executive, who shall have authority over all functions of the DSP and shall chair the Defense Standardization Council in accordance with its charter. It also directs the Secretaries of the Military Departments and the Heads of the Other DoD Components to ensure compliance with DSP policies and procedures.

As stated in DoD 4120.24-M, the goals of the DSP are to:

Improve military operational readiness by:

a. Achieving interoperability of systems, subsystems, and equipment with our allies and among the Military Departments,
b. Improving logistics support through a reduction in the variety of supply items,
c. Improving the reliability, maintainability, and safety of systems and supply items, and
d. Modernizing existing systems, subsystems, and equipment through insertion of new technology and parts.

Reduce total ownership costs by:

a. Reducing the number of nonstandard parts,
b. Facilitating competition,
c. Promoting the use of common processes and open systems,
d. Promoting standard commercial processes and practices,
e. Reducing training costs, and
f. Optimizing systems engineering requirements by reaching consensus on requirements.

Reduce cycle time by:

a. Using readily available standard items, and
b. Identifying interchangeability and interoperability requirements to permit rapid introduction of new technologies.

The DSP is an important element of the overall defense system and material management process. It uses numerous tools, including the systems engineering process, to identify those technical parameters necessary for acquisition, support, and use of defense systems and material throughout the entire product life cycle.

Defense Standardization Program Standardization Directory, "FSC Class and Area Assignments (SD-1)": SD-1 lists all DoD Standardization Management Activities (SMA) and civil agency standardization offices. It defines Standardization Areas (SAs) and assigns Lead Standardization Activities (LSA) to each SA. NGA is designated as the SMA that functions as the LSA for the Geospatial Intelligence Technology SA.

DoD 4120.24-M, "Defense Standardization Program (DSP) Policies and Procedures," March 2000: This manual provides the guidance and procedures for the DSP. It defines the DSP, the responsibilities of DSP participants, types of standardization documents, development and coordination processes, and access and maintenance requirements. Section C2.2.6 identifies LSA responsibilities, including being the technical focal point for standardization, ensuring implementation of DSP policies, and approving standards projects within the assigned area.

Geospatial Intelligence Standardization Activities

DoD Directive 5105.60, "National Imagery and Mapping Agency (NIMA)," October 11, 1996: establishes NIMA (now NGA) within the Department of Defense consistent with the authorities and duties of the Secretary of Defense and the Director of Central Intelligence (DCI) under Title 10 and 50 United States Code and Executive Order 12333, "United States Intelligence Activities," December 4, 1981. It prescribes NGA's overall mission, and clearly delineates Director, NGA responsibilities and functions, including designation as the NSG Functional Manager. The Directive applies to the DoD components and other Federal Departments and Agencies on matters related to the statutory NGA mission.

The Directive states, "The NIMA shall provide timely, relevant, and accurate imagery, imagery intelligence, and geospatial information in support of the national objectives of the United States." It assigns to the Director, NGA the responsibilities and functions of advising the Secretary and Deputy Secretary of Defense, the USD(I) (formerly part of ASD(C3I)), the Chairman of the Joint Chiefs of Staff, the Combatant Commanders, and, for national intelligence purposes, the DCI and other Federal Government officials, on imagery, imagery intelligence, and geospatial information; and supports the imagery, imagery intelligence, and geospatial requirements of the Departments and Agencies of the Federal Government, to the extent provided by law. In the exercise of these responsibilities, the Director, NGA, shall organize, direct, and manage the NGA and all assigned resources.

Section 6.11 of DoD Directive 5105.6 specifically assigns standardization responsibilities to NGA. It states that Director, NGA shall "***Prescribe and mandate standards*** and end-to-end technical architectures related to imagery, imagery intelligence, and geospatial information for the DoD Components and for the non-DoD elements of the Intelligence community…" In addition, Section 6.21 states that NGA will "Represent the Department of Defense in national and international geospatial standardization activities."

Acquisition Directives and Standardization

DoD Directive 5000.1, "The Defense Acquisition System": This Directive is a broad policy document containing what is required to establish the DoD Defense Acquisition System (DAS). DoDD5000.1 and DoDI 5000.2 provide management principles and mandatory policies and procedures for managing all acquisition programs.
They contain mandates for interoperability that have direct implications on geospatial intelligence standards activities and efforts.

This Directive applies to all the DoD Components and all acquisition programs. It states that the Under Secretary of Defense for Acquisition, Technology and Logistics (USD AT&L), the Assistant Secretary of Defense for Networks and Information Integration (ASD(NII)), and the Director of Operational Test and Evaluation are key officials of the Defense Acquisition System. Consistent with their respective authorities, they may jointly issue instructions, publications and other documentation implementing the policies contained in this Directive. The Directive states systems, units, and forces shall be able to provide and accept data, information, materiel, and services to and from other systems, units, and forces and shall effectively interoperate with other U.S. Forces and coalition partners.